

## *Kidney Health Information*

# *Renal Artery Stenosis (RAS)*

Is a narrowing to one or both of the major blood vessels to each kidney. This may be a result of kidney failure. The kidney failure can be one manifestation of blood vessel disease which is present throughout the whole arterial system. It has one common cause, Atherosclerosis, one rare cause, and one very rare cause. Rare causes (see box) are more likely in young people.

### **Atherosclerotic Renovascular Disease (ARVD)**

Is the most frequent cause of renal artery stenosis – more below.

### **Rare causes of Renal artery stenosis:**

#### *Fibromuscular Dysplasia – rare*

- An unusual condition occurring in young or middle aged women. Tissues in one or both renal arteries thicken and harden into characteristic ‘rings’, restricting the blood flow to the kidneys.
- The exact cause of this is not known, but having this condition in the family and smoking are both risk factors.

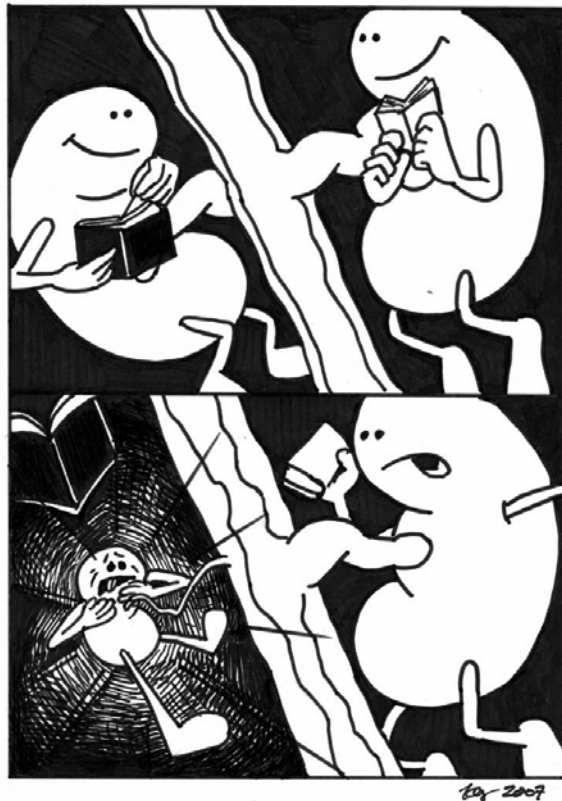
#### *Takayasu’s Disease (Pulseless Disease) – very rare*

- This is a progressive closing of the arteries branching from the arch of the aorta. This results in the absence of pulses in the arms and neck. Symptoms can include:

- Attacks of unconsciousness
- Paralysis of facial muscles
- Transient (passing) blindness

## What is Atherosclerotic Renovascular Disease (ARVD) and what are the causes?

Atherosclerosis is a disease of the arteries in which fatty plaques develop on their inner walls. This can eventually obstruct the blood flow. At the same time the arteries become thicker and harder – less able to stretch.



*Smoking, not exercising (armchair lifestyle), poor diet (too many chips!) will make renal artery stenosis worse.*

Renovascular means of the kidney (–reno) and vascular is the blood supply. So in ARVD, atherosclerosis causes narrowing of the artery to the kidney (or to both kidneys).

Atherosclerotic Renovascular Disease (ARVD) is a disease of the arteries in which fatty plaques develop on the inside of the main arteries to the kidneys. The condition is also known as 'Hardening of the arteries'. This results in narrowing and hardening of the arteries, so the blood supply to the kidneys becomes increasingly restricted (Stenosis).

ARVD is a cause of chronic kidney disease (CKD) and end stage renal failure (ESRF) which becomes more common and more pronounced with increasing age. Those with ARVD often have vascular disease affecting arteries to the heart elsewhere in the body, and they are more likely to have other diseases too. This can restrict treatment options,.

### **How is ARVD suspected?**

There may be some of the following:

- Loss of kidney function or acute renal failure.
- Chronic Kidney Disease.
- High blood pressure that does not respond to common drug treatments.
- Fluid retention.
- Sometimes, sudden attacks of fluid on the lungs, called 'flash pulmonary oedema'.

Some risk factors:

- Being older – over 50 years.
- Having Diabetes
- Smoking.
- High blood pressure.
- High blood cholesterol.
- Atherosclerosis elsewhere in the body.
- Family history of blood vessel disease.

## Diagnosis of ARVD is made by the following

- Ultrasound or other scans may show that a kidney is shrunk to less than normal size. This may lead to suspicion that its blood supply is reduced.
- To prove renal stenosis, an **angiogram** is required
  - CT or MR angiograms involve the injection of something into a vein to show up the arteries during a CT or MRI scan
  - A renal angiogram can also be done by passing a tube to the renal arteries from an artery in the groin. This can give the best quality pictures, but is more time-consuming and may be more hazardous than CT or MRI.

## Treatments aim to prevent damage and control symptoms

### Self help:

- Diets – aim to reduce the amounts of saturated fats eaten and salt intake.
- Stop smoking.
- Exercise is beneficial
- Certain over-the-counter painkillers are not helpful in renal conditions – do check with your GP or pharmacist.

### Surgical:

- Angioplasty – insertion of a small balloon to open the renal artery. This can be done during an angiogram in which a tube is passed into the renal artery from an artery in the groin.
- A stent (small plastic or sprung mesh metal tube) can be placed through the tube to keep the artery open.

## Medical:

- Careful management of high blood pressure.
- Aspirin and cholesterol lowering drugs may lower the risk from atherosclerosis. Sometimes alternatives to aspirin are required.
- In patients with fluid retention or heart failure, extra medicines may be required.

## **Surely everybody should have the narrowing relieved by angioplasty?**

Not necessarily, because

- The narrowing may never get worse
- Angioplasty may not bring back kidney function that has been lost already, and it may not help blood pressure
- Even when a stent is used, the narrowing may come back again
- There are real risks to renal artery angioplasty, including damage to the renal artery itself that can lead to the loss of that kidney.
- Whether risks outweigh the benefits may not be obvious.

## **Finding out more:**

Renal Artery Stenosis – from the NKF (UK):

<http://www.kidney.org.uk/Medical-Info/kidney-disease/Ras.html>

Renal angiography and angioplasty – from EDREN

<http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/angioshort.html>

Chronic renal failure and its progression – from EDREN

<http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/CRFLong.html>

## **Some of our ongoing projects relating to ARVD**

**Use of magnetic resonance imaging to predict which kidneys with renal artery stenosis will improve (2006)**

Not all patients benefit from renal revascularisation (having the blood supply restored to the kidneys). This may be because the kidney impairment is due to kidney damage, rather than blood vessel narrowing. Kidney volume, found by magnetic resonance imaging (MRI) is compared to kidney function. This relationship would help predict which patients would benefit from re-vascularisation. This would greatly help the management of ARVD.

**Astral 2001** –Atherosclerotic renovascular disease can lead to chronic kidney disease (CKD) and is relatively common. It places limitations on the treatment of CKD, so the prognosis is not as good. *Astral (Angioplasty and Stent for Renal Artery Lesions) is an on-going international clinical trial that is comparing surgical and medical treatments for those with Atherosclerosis.*

*Please be aware that we have made every effort to ensure this information is accurate; however we cannot guarantee that there are no mistakes. Also, the best management plans for individual patients may vary from those outlined here. Only the doctors caring for the patient will be able to advise on this. Please consult your own doctor.*

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